AMENDMENTS TO THE SPECIFICATION:

Please replace paragraph [0004] with the following:

[0004] Matching the numerical reservoir model with the dynamic data measured in the field can be done ~~in form of~~ as an optimization problem. A previously defined objective or cost function quantifies the difference between the dynamic data measured for the real medium and the corresponding responses of the numerical reservoir model. These responses are calculated by means of a numerical flow simulator. The goal of the optimization problem is to modify the reservoir model or rather the associated realization to minimize the objective function. This process is iterative : each iteration implies direct simulation of the flows. A good optimization method should allow: a) modifying realizations discretized on a very large number of grid cells; b) carrying out the modifications while respecting the stochastic model, that is the modified realization has to be coherent with the stochastic model; and c) limiting the number of direct flow simulations because they require a considerable calculating time.

Please replace paragraph [0007] as follows:

[0007] Other optimization techniques, more commonly applied, are based on ~~gradients~~ calculation of gradients. Several approaches based on gradients are presented by :

Tarantola, A. : "Inverse Problem Theory - Methods for Data Fitting and Model Parameter Estimation", Elsevier Science Publishers, 1987.

Please replace paragraph [0008] as follows:

[0008] They require calculating the gradients of the objective function with respect to the parameters of the problem which are the values of the realization at each grid cell. The realizations are then modified as a function of these gradients so that the objective function decreases. The problem related to conditioning of a reservoir model to production data is not linear : the minimization techniques using gradient calculation are used iteratively. After each modification of the realization, a direct flow simulation is carried out and the gradients are recalculated. Applied suddenly, the gradient methods lead to calibration of the dynamic data but they destroy the coherence between the stochastic model and the realization. Besides, the gradient methods do not allow ~~to~~ consideration of a very large number of parameters. In order to overcome these limits, geostatistical parameterization techniques can be integrated thereto. The pilot point method can be mentioned at this stage, which is described by :

de Marsily, G. et al. : "Interpretation of Interference Tests in a Well Field Using Geostatistical Techniques to Fit the Permeability Distribution in a Reservoir Model" in Verly, G. et al. (ed.), Geostatistics for Natural Resources characterization, Part 2, D. Reidel Pub. Co, 1984.